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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,565	10/25/2003	Todd R. Medin	200205552-1	2168

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EXAMINER

NGUYEN, LAM S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/693,565	MEDIN, TODD R.	
	Examiner	Art Unit	
	LAM S. NGUYEN	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 and 30-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 and 30-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 3-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson (EP 526884 A3) in view of Russell et al. (US 5446487).

Stephenson discloses a method comprising:

determining a property of air within an image-forming device based on a measured change in air temperature within the image-forming device (*FIG. 1-2: The different temperature sensed by sensors 16 and 17*), power supplied to a heating element of the image-forming device (*FIG. 1-2: The output of power sensor 14*), and an air flow generated by an air-moving device (*FIG. 1-2: The output of flow sensor 15*); and,

adjusting one or more parameters of the image-forming device based on the property of air determined, including maintaining a consistent air mass flow by the air-moving device (*FIG. 1-2: The controller 22 outputs signal 24/124 to adjust the operation of the fan 13/113 to maintain the air mass flow*).

Stephenson, however, does not teach wherein the heating element of the image-forming device is an element other than an image-forming mechanism of the image-forming device to heat the air flow which is used to dry colorant on media applied within the image-forming device.

Russell et al. discloses an image forming device including a heating element (FIG. 1, element 72) that is not used for image forming purpose but for heating an air flow (Fig. 1: The air flow generates by the fan 90) to dry colorant or ink applied on a printing media by an ink head/cartridge (*FIG. 1, element 52 and Abstract*), wherein the power supplied to the heating element is measured for a purpose of adjusting a fan that generate the air flow (*FIG. 1: The power measurement 118 measures the power applied to the heating element 72 and feeds back to controller 110 to adjust the fan 90*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the assembly disclosed by Stephenson to further include a heating element that is not used for image forming purpose but for heating an air flow that is used to dry colorant or ink applied on a printing media as disclosed by Russell et al. The motivation for doing so would have been to cause accelerated drying of the ink deposited on the medium to achieve satisfactory output quality in an acceptable amount of time as taught by Russell et al. (*Abstract and column 5, lines 62-66*).

- **Stephenson also discloses the following claimed invention:**

Referring to claim 3: wherein the air-moving device comprises a fan (*FIG. 1-2, element 12, 112*).

Referring to claims 4-5: further comprising measuring a change in the air temperature within the device to yield the measured change in the air temperature within the device (*FIG. 1: Temperature sensors 16-17 sense the temperature at two points inside the device 21*).

Referring to claim 6: further comprising determining the power supplied to the heating element of the device (*FIG. 1: The power is sensed by the power sensor 14*).

Referring to claims 7-9: wherein the air-moving device includes a fan and determining the air flow generated by the fan as the function of the rpm of the fan comprises empirically determining the air flow generated by the fan as the function of the rpm of the fan (*column 15, line 55 to column 16, line 6: For a certain pump, the speed of the pump is depending only on the revolution per unit time (rpm) variable of the pump*).

2. Claims 2, 10-21, 23-25, 28, 30-31, 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson (EP 526884 A3) in view of Russell et al. (US 5446487), as applied to claim 1, and further in view of Yamamoto et al. (US 5970729).

Stephenson, as modified, discloses the claimed invention as discussed above and also disclose an assembly for an image-forming device comprising an air-moving device to generate air flow (*FIG. 1-2, element 12/112*), a temperature sensor (*FIG. 1-2, element 16-17*) to measure a change in air temperature, a controller (*FIG. 1-2, element 22*) to determine air property based on the air flow generated by the air-moving device (*FIG. 1-2: The information outputted from the air flow sensor 15*), the change in air temperature (*FIG. 1-2: The information outputted from the temperature sensors 16-17*), wherein the controller is to adjust one or more operating characteristics of the air-moving device based on the air property (*column 8, lines 55-58: Mass of the exhausted air*) determined to affect one or more image-forming parameters of the image-forming device (*Abstract: The controller adjusts the flow rate in the printer*).

However, Stephenson, as modified, even though teaches the air property is mass of the exhausted air, Stephenson is silent wherein the air property is air density that can be determined by the equation $air\ density = power / C_p Q \Delta T$, where *power* is the power supplied to the heating

element, C_p is a constant representing the specific heat of air, Q is the air flow generated by the air-moving device, and ΔT is the change in the air temperature (Referring to claims 10-13, 20, 23), a relative pressure between a first side and a second side of media advancing through the image-forming device, or air mass flow by the air-moving device for heating functionality of the air-moving device (Referring to claims 14-15, 26-27, 30, 39).

Yamamoto et al. discloses a cooling apparatus having a heat generator, temperature sensors, first and second fans for generating an air flow and for exhausting the air flow, and a heat exchanger, wherein the air quantity (mass) m_a of the airflow is proportional to the air density ρ_a (column 10, line 24) that can be derived from the equation $m_a = \rho_a V_A A = Q_o / C_{pa} (T_{a.out} - T_{a.in})$ (column 10, lines 24-36) as follows:

$$\rho_a = Q_o / C_{pa} (T_{a.out} - T_{a.in}) V_A A$$

or $\rho_a = m_a / V_A A$ (Air density is determined based on air mass flow).

where :

Q_o is the amount of generated heat proportional to the power P supplied to the heat generator.

C_{pa} is the specific heat of the air (C_p).

$T_{a.out} - T_{a.in}$ is the change in temperature ΔT that also indicates the relative pressure between the input side and output side of the airflow since the pressure is proportional to the temperature in a closed space.

$V_A A$ is the air flow Q generated by the fan that is the product of the air speed V_A depending on the revolution per unit time (rpm) of the fan and the cross-sectional area A of the air flow path.

As a result, the above air density equation can be rewritten as follows:

$$\rho_a = P / C_p \Delta T Q$$

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the controller disclosed by Stephenson, as modified, to determine the air property based on the air density instead of the air mass since these two parameters are equivalent, proportional, and derivable from each other as taught by Yamamoto et al. through the above equation ($ma = \rho_a V_A A = Q \rho_a$).

3. Claims 22, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson (EP 526884 A3) in view of Russell et al. (US 5446487) and Yamamoto et al. (US 5970729), as applied to claims 21 and 31, and further in view of Ishikawa et al. (US 6511146).

Stephenson, as modified, discloses the claimed invention as discussed above except wherein the image-forming mechanism is an inkjet-printing mechanism, such that the image-forming device is an inkjet-printing device, wherein the fan assembly is to generate the air flow to heat the media to dry ink applied thereto by the image forming mechanism or to exhaust ink aerosol away from the media.

Ishikawa et al. discloses an ink jet printing apparatus having ink jet pinheads (*column 7, lines 20-28*) and a supply source of a dried warm air for generating a dried warm air flow to heat

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a printing medium to dry/exhaust ink applied on its surface by the ink jet printheads (*column 7, lines 41-55*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the printing apparatus disclosed by Stephenson, as modified, to use the heated/warm air to dry ink applied on the printing medium as disclosed by Ishikawa et al. The motivation for doing so would have been to dry ink by absorbing moisture as taught by Ishikawa et al. (*column 7, lines 40-50*).

4. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson (EP 526884 A3) in view of Russell et al. (US 5446487) and Yamamoto et al. (US 5970729), as applied to claim 31, and further in view of Wimmer et al. (US 4662622).

Stephenson, as modified, discloses the claimed invention as discussed above except wherein the fan assembly is to generate the air flow to establish a vacuum to hold down the media.

Wimmer et al. discloses a printing apparatus having a fan assembly (*FIG. 1, element 21*) that generates an airflow to establish a vacuum to hold down a printing media on a imaging drum (*FIG. 1, element 11*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the printing apparatus disclosed by Stephenson, as modified, to use the air flow to hold down the printing medium on an printing medium carrier as disclosed by Wimmer et al. The motivation for doing so would have been to mount the print media in a fixed position of the printing drum as taught by Wimmer et al. (*column 1, lines 15-18*).

Response to Arguments

Applicant's arguments with respect to claim 1, 16, 21, 28, and 31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN

03/03/2006



HAI PHAM
PRIMARY EXAMINER